IN THE SPECIFICATION:

Please amend the paragraph beginning at page 1, line 11, and ending at page 1, line 18, as follows:

--Microcrystalline silicon semiconductors have been presented since 1979, See, e.g., S. USUI and M. KIKUCHI, "PROPERTIES OF HEAVILY DOPED GD-Si WITH LOW RESISTIVITY", Journal of Non-Crystalline Solids, 34 (1979), pp. 1 to 11. This article described that a low-resistivity microcrystalline silicon semiconductor doped with ~~phosphorous~~ phosphorus was able to be deposited by a glow discharge method.--

Please amend the paragraph beginning at page 28, line 10, and ending at page 29, line 8, as follows:

--Further, the preferred proportion of amorphous phase contained in the microcrystalline semiconductor is such that when observed with the Raman spectrum, the ratio of amorphous phase related peaks to crystal phase related peaks is not more than 70%. If the average crystalline grain diameter is less than 100 Å, more ~~amorphous will exist~~ amorphous phase related peaks will exist on the crystal grain boundaries and photodeterioration is liable to occur. Also, if the crystal grain diameter is too small, there is a possibility that the mobility and lifetime of electrons and positive holes may be smaller to lower the characteristics as semiconductor. On the other hand, if the average crystal grain diameter calculated using the Scherrer's equation is greater than 1000 Å, there is a possibility that relaxation of the crystal grain boundaries may not progress sufficiently, defects such as dangling bonds may arise in the

crystal grain boundaries, and the defects may act as recombination centers for electrons or positive holes, whereby the characteristics of the microcrystalline semiconductor may be lowered. As the shape of microcrystals, a shape which is long and thin (columnar) in the direction of movement of the charge is preferred. In addition, the proportion of hydrogen atoms or halogen atoms contained in the microcrystalline semiconductor layer of the present invention is preferably not more than 30%.--

Please amend the paragraph beginning at page 29, line 20, and ending at page 30, line 4, as follows:

--As the amorphous semiconductor materials, microcrystalline semiconductor materials and polycrystalline semiconductor materials that can preferably be applied to the semiconductor element of the present invention, there are included, for example, a-Si:H, a-Si:HX, a-SiC:H, a-SiC:HX, a-SIGe:H, a-SiGeC:H, a-SiO:H, a-SiN:H, a-SiON:HX, a-SiOCN:HX, μc-Si:H, μc-SiC:H, μc-Si:HX, μc-SiC:HX, μc-SiGe:H, μc-SiO:H, μc-SiGeC:H, μc-SiN:H, μcSiON:HX, μc-SiOCN:HX, poly-Si:H, poly-Si:HX, poly-SiC:H, poly-SiC:HX, poly-SiGe:H, poly-Si, ~~Poly-SiC~~ poly-SiC, and poly-SiGe can be used ~~favorable~~ favorably.--

Please amend the paragraphing beginning at page 44, line 22, and ending at page 45, line 3, as follows:

--Using the deposited film forming apparatus shown in Fig. 2, a photovoltaic element was formed under the deposited film formation conditions shown in Table 9. After depositing a microcrystalline i-type semiconductor layer (i0 layer), ~~phosphorous~~ phosphorus

atoms were implanted into the i0 layer under the conditions shown in Table 10 with an ion implantation apparatus not shown, followed by annealing to activate the ~~phosphorous~~ phosphorus atoms.--

Please amend the paragraph beginning at page 45, line 13, and ending at page 45, line 22, as follows:

--When a cross section of the photovoltaic element of Example 4 was observed with an electron microscope, it was confirmed for the i0 layer that uniform microcrystal grains were formed extending over the whole in the layer thickness direction in a layer thickness of 3000 Å. It was further confirmed through secondary ion mass spectroscopy that the implanted ~~phosphorous~~ phosphorus atoms were distributed only on the substrate side, namely that a semiconductor junction was formed within a single microcrystal grain.--

Please amend the paragraph beginning at page 55, line 14, and ending at page 55, line 24, as follows:

--Using the deposited film forming apparatus shown in Fig. 2, a photovoltaic element was formed under the deposited film formation conditions shown in Table 23. After depositing a microcrystalline i-type semiconductor layer (i0 layer), ~~phosphorous~~ phosphorus atoms were implanted into the i0 layer under the conditions shown in Table 24 with an ion implantation apparatus not shown, followed by annealing to activate the ~~phosphorous~~ phosphorus atoms. When depositing the layer i0, SiF_4 gas of 50% of the silane gas was added at a rate of 10 times per minute for one second per addition.--

Please amend the paragraph beginning at page 56, line 7, and ending at page 56, line 16, as follows:

--When a cross section of the photovoltaic element of Example 10 was observed with an electron microscope, it was confirmed for the i0 layer that uniform microcrystal grains were formed extending over the whole in the layer thickness direction in a layer thickness of 3000 Å. It was further confirmed through secondary ion mass spectroscopy that the implanted ~~phosphorous~~ phosphorus atoms were distributed only on the substrate side, namely that a semiconductor junction was formed within a single microcrystal grain.--